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A GUIDE TO RESOLVING DISPUTES OVER DEFECTIVE SPECIFICATIONS

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1992

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The Pennsylvania State University

The Graduate School

Department of Civil Engineering

A GUIDE TO RESOLVING DISPUTES OVER DEFECTIVE SPECIFICATIONS

A Thesis in

Civil Engineering

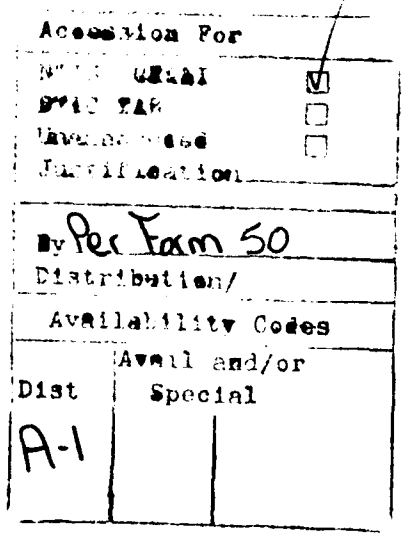
by

Steven M. Wirsching

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science

May 1992



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ABSTRACT

This thesis investigated the legal criteria involved in resolving defective specification disputes. Appellate case law was researched to discover the rules used by the court systems to decide cases involving defective specifications. These rules were organized in flow chart form to provide a guide for construction contract administrators. Separate flow charts were prepared for method and performance specifications, and the differences between the two types of specifications were discussed. Appellate court cases were used to illustrate how the courts have interpreted and applied the legal rules in construction contract disputes.

The differences between defective specifications and differing site conditions were also investigated. A discussion of the significant differences was provided to assist construction professionals in distinguishing the two dispute situations.

TABLE OF CONTENTS

LIST OF FIGURES. vi

Chapter 1. INTRODUCTION 1

Problem Statement 1
Objective 2
Value of Research 2
Methodology 2
Background 4

Methods of Recovery. 6

Organization 7

Chapter 2. METHOD SPECIFICATIONS. 9

Implied Warranty 9
Method or Performance Specification? 12
Is the Specification Defective? 14

Product Cannot Be Constructed by Method Specified. 14
End Product is Unsatisfactory. 16
Following the Specification May Not Be Sufficient. 18

Is Error Patent? 19
Did Contractor Assume Risk of Defective Specifications? 21

Disclaimers and Exculpatory Clauses 22
Warranty Clauses 25
Other Contract Clauses 28

Precompletion Loss 29

Finished Product Would Have Failed 30

Did Contractor Follow Plans and Specifications?. . . 32
Did Owner Approve the Deviation? 34

Owner Acceptance and Knowledge 34

Chapter 3. PERFORMANCE SPECIFICATIONS 36

Was Performance Impossible or Commercially Impractical? 36

Performance Must Be Impossible by Any Method . . . 40
Subjective or Objective Impossibility? 41

Did Contractor Assume the Risk of Impossibility? . . 42

Reliance of the Contractor's Knowledge or Experience 43

Chapter 4. DEFECTIVE SPECIFICATIONS VERSUS DIFFERING SITE CONDITIONS 46

Information or Instructions? 46

Difficulty in Completing the Work 47
Reliance 47
Legal Theories 48

Example of Flow Chart Use 49

Statement of Facts 50
Analysis 51
Conclusion 52

Validation of Rules 52

Chapter 5. SUMMARY AND CONCLUSIONS 54

Summary 54

Method Specifications 55
Performance Specifications 57
Defective Specifications versus Differing Site Conditions 59

Conclusions 60
Recommendations for Further Research 61

NOTES 62

TABLE OF CASES 66

BIBLIOGRAPHY 72

Appendix A. AIA WARRANTY CLAUSE 73

LIST OF FIGURES

Figure		page
2.1	Method Specification Flow Chart.	10
3.1	Performance Specification Flow Chart	37

Chapter 1

INTRODUCTION

Plans and specifications are the instruments used by owners to convey the requirements of a construction contract. They tell the construction contractor what he is expected to do so that he can formulate his bid. They are normally prepared by architectural and engineering firms hired by the owner, with assistance from various consultants. The cost of preparing high quality contract documents can be significant, and sometimes the quality of the plans is questionable. Even if it were desirable to produce perfect documents, the cost to do so would be too great. Thus, defective contract documents are not uncommon. Not surprisingly, defective specifications are a frequent cause of disputes in construction contracting.

To resolve disputes correctly at the field level, contract managers should be familiar with the legal principles associated with defective specifications.

Problem Statement

The rules used by the courts to resolve defective specification disputes are not clearly defined. An understanding of these rules is necessary to resolve

disputes. Also the distinction between defective specifications and differing site conditions is not well understood.

Objective

The objective of this thesis is to develop a guide for construction professionals to assist in analyzing and resolving disputes involving defective specifications. The guide will identify the rules used by the courts to resolve disputes, and provide guidance on recognizing defective specifications and distinguishing them from differing site condition claims.

Value of Research

This guide will provide field level personnel with the knowledge to correctly identify and resolve defective specification disputes. This information will promote better contract management and help avoid costly and unnecessary litigation.

Methodology

A thorough review of the literature available on defective specifications was conducted. This review

included literature written for the construction industry and legal treatises written for law professionals. The purpose of this review was to determine the current state of knowledge concerning defective specifications, ascertain what rules are believed to exist, and determine if these rules were consistent among the treatises. From the literature review, significant judicial decisions were identified which provided the basis for a case review.

Appellate court decisions relating to defective specifications were examined to establish the rules used by the courts to resolve disputes. This review was conducted according to the following guidelines:

1) Over 100 appellate court decisions were reviewed to establish the rules used by the courts.

2) Cases were not limited to any particular time period or jurisdiction and included cases involving public and private owners.

3) Only construction or construction related cases were used to develop and illustrate the rules.

From the case review, a flow diagram was developed which can be used to resolve disputes.

The rules were verified using the outcome from ten recent appellate court decisions.

Background

Project plans and specifications function together to describe the contract requirements. The drawings graphically show the work to be constructed and include location, dimensions, and arrangement of components, materials, and systems. The specifications provide technical information concerning building materials, components, systems and equipment indicated on the drawings with respect to quality, performance characteristics, and results to be achieved.[1]

The literature indicates that the plans and specifications are considered defective if performance is impossible, or if the finished product fails or does not accomplish its intended results. There are many causes of defective specifications. They can be caused by incomplete or incorrect information used in the design process, errors in judgment or calculations, or inexperienced or incompetent designers, to name just a few.

The landmark legal case dealing with defective specifications is the 1918 decision by the Supreme Court in **United States v. Spearin**. Spearin was constructing a drydock for the Navy at the Brooklyn Navy Yard in accordance with plans and specifications which had been prepared by the government. A portion of the contract required Spearin to relocate a 6-foot sewer which intersected the site, and the

plans prescribed the dimensions, material, and location of all sections to be constructed. The sewer subsequently failed and flooded the site. The contractor refused to continue working, and the Navy terminated the contract. The Supreme Court sided with the contractor stating that if the contractor is bound to build according to plans and specifications prepared by the owner, the contractor will not be responsible for the consequences of defects in the plans and specifications."[2] This decision was based on the principle that when the owner prescribes the character, dimension, and locations of the work, there is an implied warranty that the plans are sufficient, and the outcome will be satisfactory.

A review of appellate court decisions shows that although frequently followed, the Spearin Doctrine does not automatically provide relief for a construction contractor, and there are notable exceptions to this doctrine.

Available legal and contract administration treatises provide very little guidance relative to the resolution of defective specification disputes. Most acknowledge the Spearin doctrine in that if a contractor follows defective plans and specifications furnished by the owner, he will not be responsible for loss or damage which results. Many professionals acknowledge exceptions to this rule. There are many inconsistencies among treatises, and none completely identifies and analyzes the rules applied by

courts to resolve defective specification disputes.

Another problem in the literature is the failure to clearly distinguish differing site condition disputes from defective specification disputes. Although the two sometimes appear to be quite similar, the legal rules are quite different. The distinction can be difficult when an underground structure such as a building foundation or sewer system fails due to a defective design caused by unsuitable soil conditions.

Methods of Recovery

Courts have developed two methods for resolving defective specification disputes depending on whether the specification is a method or performance specification.

Method specifications, sometimes called design specifications, tell the contractor what he is expected to do, the type of equipment he must use, and the procedure he must follow in performing a construction operation. For example, a method specification for soil compaction may require the contractor to use a certain size and type of compactor, and tell him exactly how many passes to make. Design specifications provide detailed design information such as dimensions, tolerances, materials, etc. For example, a design specification for a foundation would prescribe the location and dimension of the foundation,

size and location of reinforcing steel, required concrete strength, and acceptable tolerances. Although technically different from a method specification, the terms are normally used interchangeably by courts, and the legal rules are the same. For design and method specifications, the contractor seeks compensation based upon the legal theory of implied warranty.

Performance specifications specify the result which must be achieved and leave the method of accomplishment and often the design details to the contractor. For the compaction example, the contract would specify the desired density of soil, and allow the contractor to choose the equipment and methods he desires to achieve compaction. For this type of specification, there is no implied warranty, and the contractor must prove that the specification was impossible or commercially impractical.

Organization

This thesis is divided into five chapters. Chapter 2 covers disputes involving method specifications while Chapter 3 covers performance specifications. The rules used by the courts are presented in flow chart form, and are discussed in the text. Examples detailing how courts have applied the rules are used frequently. Chapter 4 discusses the differences between defective specifications and

differing site conditions, and provides examples of how a contract administrator can use the flow charts developed in Chapters 2 and 3. Summary and conclusions are in Chapter 4.

Chapter 2

METHOD SPECIFICATIONS

When a defective specification dispute involves a method specification, a contractor seeking additional compensation relies upon the theory of implied warranty. This chapter focuses first on the theory of implied warranties relating to plans and specifications, and then discusses the rules used to resolve defective method specification disputes.

Figure 2.1 provides a flow chart of the rules that the courts have applied to decide defective method specification disputes. The rules are discussed and explained in the text, and examples are presented to illustrate how courts have applied the rules.

Implied Warranty

The general rule in construction contracting is that "even though the plans upon which a contractor undertakes to construct a building are so defective as to cause the building to fall while in the course of erection, he is generally not relieved"[3] unless it can be shown that the owner expressly or implicitly warrants the sufficiency of the plans.[4] The legal theory of implied warranty forms

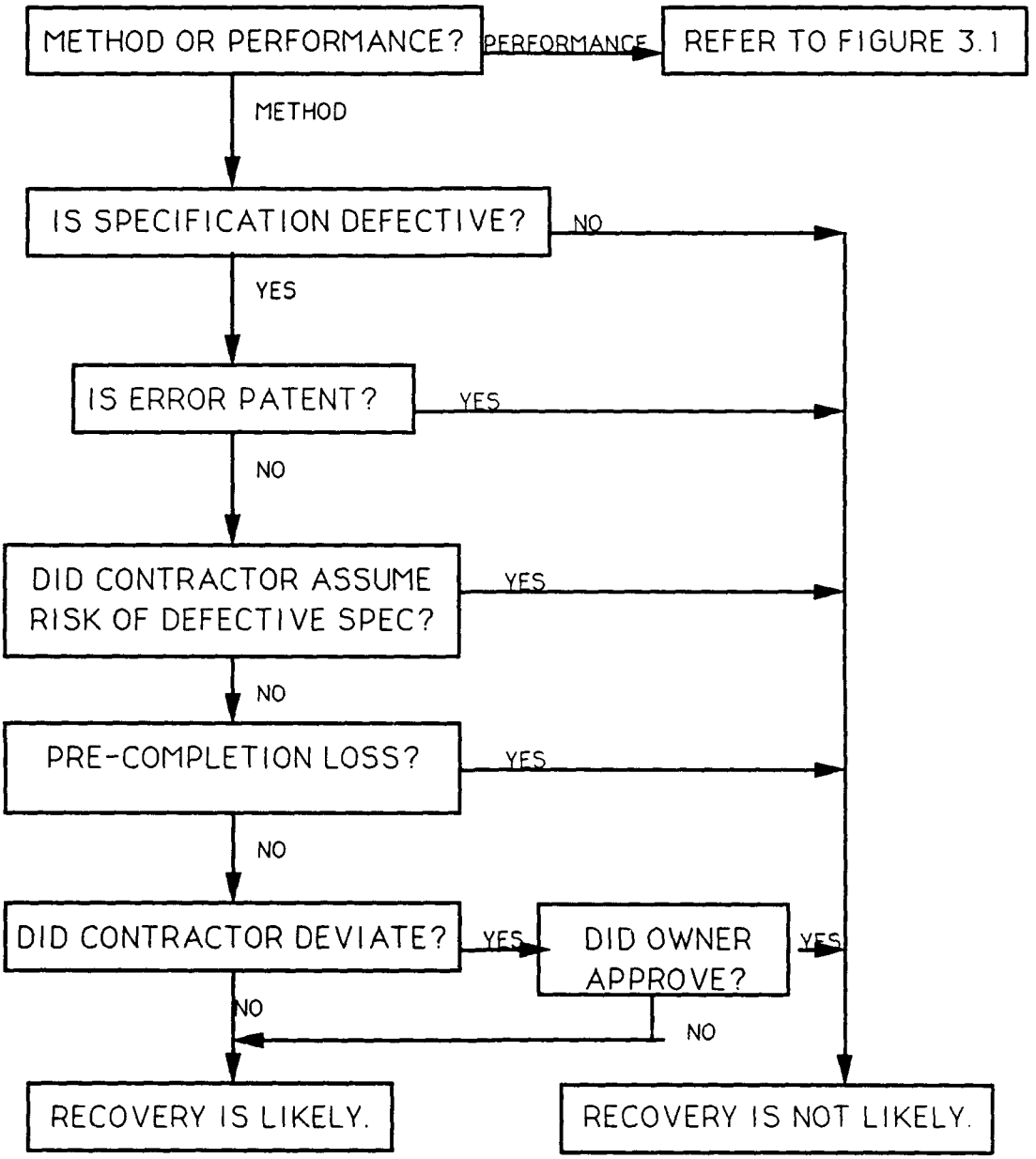

Figure 2.1 Method Specification Flow Chart

the basis of recovery for defective specification disputes.

Implied warranty is a broad legal theory which applies to many aspects of construction contract law. For example, there are implied warranties relating to the quality of workmanship provided by contractors and the suitability of products furnished by manufacturers. For the purposes of this thesis, implied warranty is limited to its application as it relates to an owner providing plans and specifications which a contractor must follow.

Most courts find that by providing a method specification, the owner implicitly warrants that the specification is correct. As explained by one court, this concept rests on the presumed expertise of an owner where it sees fit to prescribe detailed specifications.[5] This view was affirmed by the U. S. Supreme Court in **U. S. v. Spearin**, where the court held that if a contractor is bound to build according to detailed specifications, the contractor will not be responsible for the consequences of the defects.[6]

The argument for an implied warranty rule is particularly convincing when the detailed design in question is complex, state of the art, or relies on engineering data not readily available to the contractor. Foundation designs, for example, often fit this latter case, particularly when designed for large buildings or heavy loads. The contractor does not have an obligation to independently evaluate soil conditions and anticipated

loading conditions to ascertain if the foundation will function properly. The contractor is entitled to rely on the accuracy and suitability of the design.

Method or Performance Specification?

The determination of whether the specification is a method or performance specification is critical since the implied warranty of adequacy of specifications applies only to method specifications.[7] Method specifications give detailed instructions that a contractor must follow or design details, dimensions, materials, etc. which the contractor must comply with. Performance specifications provide only the expectations of the finished product, and allow the contractor to choose the method and means to achieve that result.

Of course, many contracts mix performance requirements and methods specifications in a single contract, and this sometimes makes it difficult for a court to determine which legal rules to apply. This issue was discussed in **Utility Contractors v. U. S.** "The court has difficulty in believing that every government contract can be placed in such black and white terms as design specification or performance contract. The court does not necessarily find that these terms have to be so mutually exclusive. Certainly one can find numerous government contracts exhibiting both

performance and design specification characteristics."[8] Some courts have examined the contract as a whole to determine which type of contract was intended. Such was the case in **Utility** where although there were numerous method type specifications, the court found that "at almost every step, the contractor was to use its own judgement and experience in deciding how, when, where, under what conditions, and which proportion would be best for which project section."[9] Thus, the court determined that the contract was a performance type contract which did not carry an implied warranty.

When possible, courts will isolate the specific cause of the failure to determine which type of specification controlled. The key factor the court is searching for is who chose the method or design which proved inadequate. If the contract allowed the contractor to choose the method or design which caused the problem, the contractor will have difficulty passing the liability for failure to the owner. If the contract required the contractor to follow a particular method which proves to be the cause of failure the contractor will normally not be responsible for the failure.

Is the Specification Defective?

Although the term defective specification is commonly used to describe many types of problems with plans and specifications, there are only two general defective specification situations: when the product cannot be constructed by the method specified, or when the end result derived from following the specified method fails or does not meet the end requirements. These two situations are discussed.

Product Cannot Be Constructed by the Method Specified

If a contractor is not able to construct the product by the method specified or the design provided, he is likely to recover. However, he will not recover simply because the method is more difficult or expensive than he anticipated. Rather, he must show that the method is impossible. He need not show that the outcome cannot be obtained by any method, but only that the specified method is not possible. A few examples illustrate what courts have considered defective. The topic of impossibility is also discussed in Chapter 3.

The plans were considered defective in **Laburnum Construction Corporation v. United States** when the contractor laid out an aboveground steam line and discovered

that the plans required him to install the line through a swamp, a garbage dump, and across the steps of a building. The work could not possibly have been constructed as designed, and the contractor recovered for his additional costs to modify the route and for his delay costs.[10] Similarly, in **J. D. Hedin Construction Company v. United States** the plans were defective where thin shell sheet piles required by the specifications were improper for the soil conditions, and could not be successfully driven to form pile groups.[11]

In the above cases, the contractors were able to recover under the theory of implied warranty because the work could not be built as designed. A new design or other materials were required. In fact, courts frequently interpret agreement by the owner to modify the contract as acknowledgment that the specification is defective.

However, the contractor cannot recover simply because the work is more difficult or more expensive than anticipated. In **Sandy Hites Co. v. State Highway Commission,** the Missouri Supreme Court ruled that the contractor could not recover the cost of additional material required when the required method for concrete paving resulted in the thickness of the finished road being greater than required by the contract. The court found that the specification was not defective simply because the method did not result in exactly seven inches of pavement, and that

the contractor was responsible for the additional cost of material.[12]

End Product is Unsatisfactory

The second common defective specification situation results when the end product achieved by following the required method does not measure up to expectations. The rule is clear and consistent under these circumstances. "In the jurisprudence of public contracts, the Government is held to warrant that if design plans and specifications are flawed, the contractor will not be liable for defective performance or products"[13] Thus, if the finished product is inadequate due to a defective method specification, the contractor will normally not be liable.

Frequently, problems arise when the contract contains both a detailed method which the contractor must follow and a specified outcome that the method must achieve. If the contractor shows that the method is defective and won't result in a suitable finished product, he will normally not be responsible for the unsatisfactory results. Several examples illustrate this situation.

The specification was considered defective in **M^cCree and Company v. State** when the contractor was unable to achieve the compaction required by the contract when the contract also included a detailed method specification which

the contractor was required to follow.[14]

Similarly, an Illinois court ruled that the specification was defective in **W. H. Lyman Construction Co. v. Village of Gurnee** when the required method for sealing manhole bases did not result in the manholes meeting the infiltration limits required by the contract.[15]

Another common source of dispute is when the final outcome fails or does not satisfy the owner. Typically, disputes occur when the owner requires the contractor to correct or redo the unacceptable outcome or failure. Again, the contractor will be allowed to recover if the shortcoming is due to an inadequate specification.

For example, a contractor recovered the expense of removing and replacing joint sealer which exhibited lack of bonding, tackiness, variation in depth, and other problems. The contractor proved that he had followed the owner's detailed specification using the specified material which was tested and approved by the owner. The court concluded that the numerous deficiencies were caused by improper materials and methods required by the contract.[16]

In **Puget Sound Nat. Bank v. C. B. Lauch Construction Co.** the owner required the contractor to apply a third coat of paint to an apartment complex when the required two coats showed excessive fading. The court, in awarding compensation to the contractor noted, "The contract called for a two coat paint job, not three, and whether the job was

sufficient or not, it was the specification under which [the contractor] did the painting... He was to apply two coats of paint of a specified kind, and whether or not it was sufficient was a matter which [the contractor] had no control."[17]

Following the Specification
May Not Be Sufficient

To recover under the theory of implied warranty, the contractor must prove that the plans are defective. It may not be sufficient for the contractor simply to show that he followed the plans and specifications and the results were not successful. He frequently must prove that the specification was defective. This issue was explored in **Mayville-Portland School, Etc. v. C. L. Linfoot**, when the contractor refused to repair or replace a tank he installed which was discovered to have been damaged and unfit for its intended purpose. Linfoot claimed he installed the tank according to the plans and specifications, and therefore, he was not responsible for the damage. The court stated, "These North Dakota Cases and the cases cited from other jurisdictions, therefore do not automatically relieve the contractor of liability for defects when he has followed plans and specifications furnished by the other party. The contractor; however, may be relieved of liability if the

plans or specifications furnished by the other party were defective or insufficient, and such defects or insufficiency caused the damage complained of."[18] The contractor was forced to pay for a new tank when he failed to prove that the plans and specifications were defective or insufficient.

The **Mayville-Portland** decision discussed several cases which used slightly different wording which would imply that the contractor simply has to show that he followed the plans and specifications and does not have to show that the plans were defective. The court noted however, that the plans were, in fact, defective in all these cases.[19] No cases were discovered where a contractor was able to recover without showing that the plans or specifications were defective. Occasionally, though, the courts have concluded that the specifications were defective by the process of elimination. If the contractor can prove that he followed the specification, and all other possible causes of failure are eliminated, the court may conclude that the specification must have been defective. A finding that the specification is defective is critical.

Is Error Patent?

An exception to the implied warranty rule exists when the contractor knows, or should have known, that the specifications are defective. When faced with a significant

and obvious omission, inconsistency, or discrepancy, the contractor has a duty to call it to the attention of the owner.[20] One court described this duty as based on the principle that a contractor cannot knowingly produce something useless and charge the customer for it.[21] To be considered obvious under this rule, the error must be glaring and significant. this research yielded few cases that contained errors so obvious and glaring as to compel the court to invoke the patent ambiguity rule.

One error which was considered patent was discussed in **Allied Contractors, Inc. v. United States**. Allied was constructing a "Nike Launching Area" for the Corps of Engineers. The contract required the contractor to construct two unsupported four-inch thick masonry walls against a soil bank. The contract did not require any support for the walls, but later in the project the walls were to be waterproofed and backed by a two-foot thick concrete wall. As a result of heavy rains, hydrostatic pressure caused the masonry walls to collapse. The contractor claimed that it built the walls exactly as called for by the plans, and that improper design was the cause of the failure. Rejecting the contractors argument, the court found "it is not true that [Allied] was justified in blithely proceeding with its work in the face of obvious and recognized errors. The obligation was cast upon [the contractor] to do something about it."[22]

This patent error rule does not, however, protect the owner from liability when a contractor discovers a significant error and calls the owners attention to it. In **Ridley Investment Company v. Croll**, a court found the owner responsible where the contractor notified the owner of a defective design due to unsuitable soil under a floor slab. The owner directed the contractor to continue the project without making provisions for additional support for the floor, and excessive settlement caused damage to the facility.[23]

Did Contractor Assume Risk of Defective Specifications?

Owners frequently include exculpatory clauses and warranty provisions in the contract which attempt to shift responsibility for the adequacy of the plans and specifications from themselves to the contractor. Disclaimers and exculpatory clauses are rarely successful when the owner has provided a detailed design which the contractor is required to follow. Warranty clauses are occasionally so specific that the risk of the specifications being defective shifts to the contractor. Contractors should study the wording of the contract prior to bidding to ascertain the extent of the warranty clause.

Disclaimers and Exculpatory Clauses

Exculpatory clauses are frequently included to relieve a party from negligence or liability for damages. They are generally valid and will be enforced unless (1) it would be against public policy, or (2) there is something in the social relationship of the parties militating against upholding the agreement.[24] Exculpatory clauses are however, not favored by courts and will be strictly construed against the party seeking to benefit from them.

It has long been held that general disclaimers such as those requiring the contractor to visit the construction site, and to check the plans and specifications have little or no affect on the implied warranty of the sufficiency of the plans and specifications. As stated in **Spearin:**

> The obligation to examine the site did not impose upon him the duty of making a diligent inquiry into the history of the locality, with a view to determining, at his peril, whether the sewer specifically prescribed by the government would prove adequate. The duty to check plans did not impose the obligation to pass upon their adequacy to accomplish the purpose in view. And the provision concerning contractors responsibility cannot be construed as abridging rights arising under specific provisions of the contract.[25]

Courts have consistently held that a disclaimer must be specific, and that general disclaimer clauses similar to those in Spearin and in most government contracts do not relieve the owner of liability for defective specifications.

Clauses which specifically disclaim responsibility for the adequacy of the design are sometimes used and are occasionally determined to be valid. A clause included in the contract in **Philadelphia Housing Authority v. Turner Construction Co.** serves as an example. The method specification for interior painting for a housing development was defective, and the contractor was forced to use a different and more expensive paint than specified in the contract. However, the contract also included a specific end result, and contained the following exculpatory clause:

> By submitting a bid the bidder agrees that he has examined the site and the specification and drawings, and where the specification requires in any part of the work a given result to be produced, that the specifications and drawings are adequate and the required result can be produced under the specification and drawings. No claim for any extra work will be allowed because of alleged impossibilities in the production of the results specified or because of inadequate or improper

> plans and specifications and wherever a result is required, the successful bidder shall furnish any and all extras and make any changes needed to produce, to the satisfaction of the local authority, the required result.[26]

The court found the clause to be valid. Although the specification was defective, the contractor was unable to recover additional costs.

However, specific disclaimers may be scrutinized closely by the court and found to be not valid. In **W. H. Lyman Const. Co. v. Village of Gurnee**, in addition to the detailed design for the submerged manhole bases, the specification included a clause holding the contractor solely responsible for meeting the infiltration limits set in the contract. The provision required the contractor to indicate in writing with his proposal if he could not comply with the infiltration requirements. The method required by the specifications proved defective and the contractor eventually received permission to seal the manhole bases using a method prohibited by the plans and specifications. The court found the disclaimer to be an impermissible attempt to shift responsibility for the adequacy of the specifications without providing the contractor the opportunity to choose the method of sealing the bases. This provision was determined to be against settled public policy that an owner implicitly warrants the sufficiency of method

specifications.[27]

Warranty Clauses

Most warranty clauses, such as the standard American Institute of Architects' Guaranty Clause, require the contractor to remedy any defects caused by faulty materials and workmanship which appear within a specified time period, usually one year. The most recent AIA Warranty Clause is included in Appendix A.

Although occasionally challenged, courts have consistently held that, when a warranty clause extends only to materials and workmanship, the contractor will not be liable for a failure due to a defective design. The court in **Teufel v. Wienir** confirmed that under a contract utilizing a standard AIA warranty clause, the contractor is not liable if the item's failure to function properly is due to defective design.[28]

Occasionally, however, warranty clauses are written in such a manner that the contractor guarantees the performance of the finished product regardless of the reason it fails or is defective. When more comprehensive clauses are included in the contract, the court may find that the contractor is responsible for failure even if it was caused by defective design. In **Shopping Center Management Company v. Rupp**, the contractor was held responsible for equipment whose failure

was due to a defective design. The contractor provided two submersible sewage pumps which met contract requirements, were approved by the owner's architect, and installed according to the plans. Shortly after installation, the pumps failed because the pumps were not built to operate under the conditions that the owner's design required. The contract warranty provided that "The contractor shall guarantee the satisfactory operation of all materials and equipment installed under this contract, and shall repair or replace, to the satisfaction of the owner or architect, any defective material, equipment, or workmanship which may show itself within one year after the date of final acceptance."[29] The court held that, under the language of the guarantee, the contractor assumed the risk that the equipment installed by him would operate satisfactorily

Another court came to a similar conclusion that the warranty clause required the contractor to guarantee the installation of a heating system which failed due to a defective design. The warranty clause held the contractor responsible "for anything that goes wrong a year from the date of completion." Although the contract required the work to be done in strict accordance to plans and specifications, and there was no evidence that he did not conform to the requirements, the court held that the contractor made an express and comprehensive warranty that the heating system would give reasonably satisfactory

performance for a year after its installation.[30]

Courts will likely examine a warranty clause as well as other contract clauses and apply the rules of contract interpretation to ensure that the interpretation of the clause is reasonable and in harmony with the general intent of the contract. In **Kurland v. United Pacific Insurance Company**, the court found that a guarantee that a cooling system would establish at least a 30-degree variation from outside temperature for cooling constituted a statement of purpose sought to be achieved by means of the owners plans and specifications where the contractor was required to follow a detailed design. The court concluded that the system was inadequately designed, and that "the subcontractor did not warrant or guarantee that the system embodied in the architect's plans and specifications would produce the desired variation for cooling of the apartment building.[31]

Firm guidance cannot be provided as to when the court will find a warranty clause valid and binding for defective specifications. If the wording is clear and specifically includes defective specifications as one item covered by the warranty, the court will likely uphold the clause. When the clause is less explicit, the court will examine other contract clauses and perhaps the actions of both parties to determine the intent of the warranty clause. Generally, the court will be hesitant to shift the risk of the adequacy of

the design unless the contract has clearly spelled out the intent that the risk was shifted to the contractor.

Other Contract Clauses

Occasionally, courts have found that a clause or combination of clauses included in the contract limits the implied warranty of the specifications. For example, the court in **Emerald Forest Utility District v. Simonsen Construction** found that a combination of clauses amounted to an express guarantee to provide a working sewer free from defects. Although the owner failed to provide sufficient plans and specifications, the court determined that the owner did not implicitly warrant the plans. Instead, a clause requiring the contractor "to complete the structure according to the contract and to prepare the site and structure in a workable condition for final acceptance"[32] combined with a provision that all work be "able to pass any inspection, tests or approvals provided for in the contract"[33] was an express warranty that the sewer line would be completed and acceptable.

A similar decision was reached by the Louisiana Supreme Court in **Brasher v. City of Alexandria**. The court concluded that, after consideration of the contract clauses and the facts and circumstances of the case, there was no implied warranty as to the sufficiency of the plans. Instead, the

court interpreted a clause requiring the contractor to "correct any deficiencies existing in the sewers, manholes or other appurtenances, and put the entire system in working condition"[34] to be an express requirement to provide a complete working sewer system.

Precompletion Loss

A specification is considered defective and carries an implied warranty when the work cannot be performed as shown, and when the end result fails or does not meet the end requirements. One situation where an implied warranty may not hold is when failure occurs prior to completion of the structure. Unless the contract provides otherwise, the contractor is normally responsible for protection of his work during construction, and the implied warranty will not extend to precompletion loss. As explained by one court:

> ...we cannot find on the record in this case that compliance with the plans and specifications would produce anything other than satisfactory results. The evidence is that the completed drainage ditch is satisfactorily performing the function for which it was designed... It is true that the design did not prevent damage while the ditch was in an uncompleted state. But the government was under no obligation

that it do so...[35]

Thus, the owner does not warrant that a partially completed structure will not be damaged, and he does not have an obligation to design a structure such that it is impermeable to any damage during the course of construction. As stated in **Utility Contractors, Inc. v. U. S.**, "absent any contract provision to the contrary, the government implicitly warrants that satisfactory performance will result. This is not a warranty against pre-completion losses unless they are caused by compliance with governments defective design specifications."[36]

In **Utility**, the court determined that the owner "was not required to design this project or provide protective measures so the project could be built under all situations, including heavy rainstorms."[37] The contractor was unable to recover damages when heavy runoff damaged uncompleted concrete sections since the contractor was required to possess sufficient expertise and knowledge to protect his unfinished work.

Finished Product Would Have Failed

An exception to this rule may exist if the pre-completion loss is caused by compliance with the defective specification. Thus, if the contractor can show that the

finished product would have failed anyway he will likely be able to recover.

Blue Bell, Inc. v. Cassidy illustrates this exception. During the course of construction of an industrial type building, two building columns failed due to excessive soil settlement, and a portion of the roof collapsed. There was no evidence that the contractor was negligent in protecting his uncompleted work, and the evidence indicated that the columns would have failed even if the structure was complete. In this situation, the contractor was not liable for the building failure.[38]

A similar decision was reached in **Miller v. Guy H. James Construction Co.** where the contractor was awarded his costs to repair damage caused when heavy rains washed out his partially completed ditch liner. The court allowed recovery since the final design slope was too steep and allowed the run-off water to flow at excessive velocity. The drainage system design was defective, and the finished project would likely have been damaged even if completed as designed.[39]

Thus, the contractor is allowed to recover when the defect would have caused damage to the end product, and cannot be labeled pre-completion loss. If the damage is caused by the contractors failure to protect work which has not been completed, he is not likely to recover.

Did Contractor Follow Plans and Specifications?

The final exception to the implied warranty rule exists when the contractor deviates from the specification - even if the specification is defective and cannot be constructed as required or will not result in a satisfactory end product. This exception is based on the general rule that when an owner specifies a particular method or design, the contractor has no right to depart from those plans and specifications. If a contractor does depart from the contract without permission, he becomes the guarantor of the strength and safety of the structure.[40] This rule applies even if the plans and specifications are defective.[41]

This rule was invoked in **Valley Construction Co. v. Lake Hills Sewer District** when the contractor deviated from the specifications while installing a sewer line. The contract required the contractor to hand shape the trench bottom so that the pipe would rest uniformly on the shaped trench bottom. During excavation, the contractor encountered hardpan material, and determined that handshaping was impossible. He orally requested permission to use bedding gravel, which was a unit price pay item requiring permission from the engineer. When the engineer disapproved his request, the contractor chose to deviate from the contract by using a cushion course method for installing the pipe. When 48 sections of the pipe which the

contractor installed using this method broke after a heavy rain, the contractor refused to replace the broken sections, claiming the damage was caused by an impossible specification. The court acknowledged that expert witnesses agreed that bedding material was required and that handshaping the trench was not an adequate method, but stated "Be that as it may, respondents agreed to follow the specifications provided by appellant, as long as they did so, they would not be liable for any disastrous consequences." The court further stated that the contractor "would only be discharged from nonperformance or poor workmanship by following the specifications." [42]

In **Robert G. Regan v. Fiocchi**, a masonry subcontractor installing brick veneer walls did not install wall ties at the spacing required by the specification. When several walls bulged, the deviation was discovered and the subcontractor was ordered to correct the condition. The subcontractor refused to remove the bricks and install the required ties. The court discounted expert testimony by an architectural engineer that the walls would have bulged even if the specifications were followed. The court found the evidence immaterial when the contractor chose to depart from the specifications.[43]

The contractor might be able to overcome this rule if he can show that the deviation was minor and had nothing to do with the failure. For example, in **Burke City Public**

School, Etc. v. Juno Construction, the contractor was able to recover when he proved that the damage to a roof was not caused by his slight deviations from the specification, but rather that the failure was caused solely by the defective design. The court held that the owner was required to prove that the breach of contract contributed to the damages sustained by the owner.[44]

Clearly however, all cases demonstrate that the contractor is placing himself at risk when he deviates from the plans and specifications which he has agreed to follow.

Did the Owner Approve the Deviation?

The contractor will, however, be likely to recover his costs if the owner approves the deviation. **W. H. Lyman v. Village of Gurnee** is a recent case which illustrates this point. The Village contended that the contractor was liable for additional costs since he deviated from the specifications to seal the manhole bases. The court rejected this argument since the deviation was approved by the supervising engineer.[45]

Owner Acceptance and Knowledge

The contractor will also be likely to recover if the owner knows of a deviation, but accepts the completed

structure anyway. The rule, as stated by one court holds that "Where the owner accepts a structure without complaining, within a reasonable time, of defects or contract deviations which are known to him or which are open, obvious and apparent, he is precluded from seeking damages for those defects or deviations."[46]

The courts may also find that the contractor can recover simply because the owner had knowledge of a deviation and did nothing. The results, however, are not as predictable as when the structure has been accepted. For example, the engineer in **Valley Construction Co. v. Lake Hills Sewer District** knew of the deviation and described the work as excellent. The court rejected this argument by the contractor since the contract required all changes to be in writing.[47]

A complete analysis of when knowledge is sufficient to establish acceptance is beyond the scope of this paper, and will not be discussed further. To avoid problems, the owner or his representative should promptly notify the contractor of non-conforming work to which he objects.

Chapter 3

PERFORMANCE SPECIFICATIONS

This chapter focuses on the rules followed by the courts in disputes involving performance specifications. Figure 3.1 shows the rules the courts have followed to resolve performance specification disputes. When a dispute involves a performance specification, courts apply the rules of impossibility. These rules place a greater share of the risk on the contractor.

The primary feature of a performance specification is that it will "set forth an objective or standard to be achieved, and the successful bidder is expected to exercise his ingenuity in achieving that objective or standard of performance, selecting the means and assuming a corresponding responsibility for that selection."[48]

Was Performance Impossible or Commercially Impractical?

A performance specification is defective only if the requirement set forth is impossible or commercially impractical. Absolute impossibility implies that the work is physically impossible or beyond the state of the art. Commercial impracticality exists if the work is physically

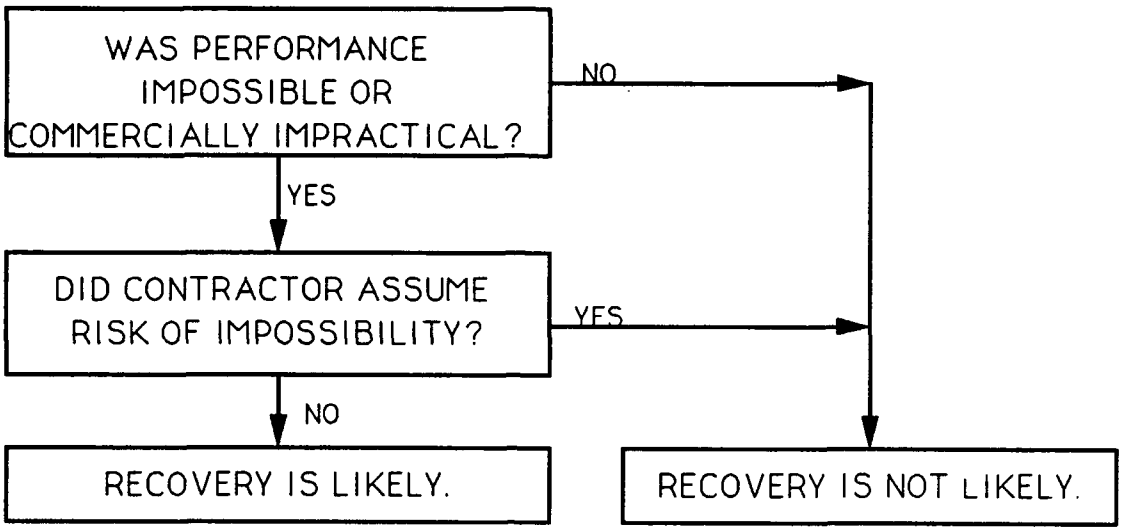

Figure 3.1 Performance Specification Flow Chart

possible, but at great cost. As stated by Williston

> The true distinction is not between difficulty and impossibility. A man may contract to do what is impossible as well as what is difficult, and be liable for failure to perform. The important question is whether an unanticipated circumstance has made performance of the promise vitally different from what should reasonably have been within the contemplation of both parties when they entered into the contract. If so, the risk should not be thrown on the promisor.[49]

Thus, a contractor can recover for the difficulty or added cost if he can show that the difficulty is beyond what the parties contemplated when the contract was made. It is not really important how much more difficult the work must be to qualify as commercially impractical. There are no specific criteria. As stated by one court:

> The doctrine ultimately represents the ever-shifting line, drawn by courts hopefully responsive to commercial practice and mores, at which the community's interest in having contracts enforced according to their terms is outweighed by the commercial senselessness of requiring performance.[50]

To determine what the parties contemplated, courts may examine the entire contract plus the actions of the parties.

For example, if the work required the contractor to use a special piece of equipment or method which was clearly not envisioned by the contract, this fact might be an indication that the difficulty was beyond what was contemplated. Another indicator might be if the difficulty was so great that the contractor could never have completed the project within the scheduled completion date.

The decision in **Tombigbee Constructors, Inc. v. United States** illustrates where a court found a performance specification commercially impractical. Although the contractor was able to achieve the required 95 percent compaction on the first half of the project, the court was influenced by testimony that "compaction was achieved slowly, with difficulty and great cost, with the use of a variety of equipment, and without possibility of meeting the construction schedule"[51] The court also found it significant that, approximately half way through the job, the owner consented to a change order to allow the contractor to add Portland Cement to the soil for the remainder of the project. The court treated the change order as an admission that the compaction could not be achieved within the time set forth by the contract.

The **Tombigbee** case is contrasted by **Baton Rouge Contracting Co. v. West Hatchie Drainage Dist.**, where the contractor was unable to recover additional costs when he encountered difficulty maintaining a required 1:1 slope on

the bank of a channel he was dredging. The contractor argued that the 1:1 slope was defective, and a flatter slope was more desirable. The court ruled against the contractor since, even though it was more difficult than he had anticipated, he was able to achieve the slope according to the contract requirements, and the project was completed within the specified time.[52] The significant difference between the two cases was not the degree of difficulty encountered, but the difficulty appearing to be beyond the contemplation of the parties.

Performance Must Be Impossible by Any Method

Since the contractor is not limited to one particular method, he has the added burden of showing that the outcome could not be met by any reasonable method, and not just the one he chose. In **Koppers Company v. United States** the court held that the contractor did not prove that the specification to produce runway mats for the Corps of Engineers was impossible or commercially impractical. The contractor chose to abandon his efforts to produce the matting when his first attempts to meet strength requirements were unsuccessful. He refused to use a different core material or alter his fabrication procedures to produce a mat which complied with the specification. Based on his initial attempts, he concluded that the

specification was commercially impractical. The court found that the contractor did not show that "a competent contractor either could not have performed the contract or that performance involved unreasonable and excessive costs."[53]

Subjective or Objective Impossibility?

Impossibility can be divided into two categories - objective and subjective. Impossibility may be due to the nature of the work to be done or to the capacity of the promisor to do it. The difference can be thought of as the difference between "it cannot be done" (Objective), and "I cannot do it" (Subjective).[54] A contractor cannot be excused from performing his contract due to subjective performance. Instead, he must show that the impossibility was due to the nature of the work and not due to his inability to perform. Two cases will illustrate this point.

In **Ballou v. Basic Construction Company**, the contractor was found in breach of his contract when he failed to manufacture two hundred acceptable pre-cast concrete columns. The contractor argued that the columns, as designed, were extremely difficult to construct, and that the tight construction schedule required by the contract made performance commercially impractical. The court found that the columns were possible to manufacture since the

contractor had manufactured 45 columns, and that the failure to manufacture the columns was purely subjective. No objective impossibility was shown. Simply because he could not manufacture 200 acceptable columns within the allotted time did not excuse performance.[55]

A similar decision was reached in **B's Company Inc. v. B. P. Barber and Associates, Inc.** where a subcontractor claimed that installation of two water mains under a river was impossible when two attempts to install the lines were unsuccessful. The court rejected the sub-contractor's claim since another contractor was able to complete the project by employing an alternate method of installation. The court found that "the evidence shows this to be a most difficult job requiring an experienced crew and proper equipment, but the trial judge found that it was not impossible to perform. It appeared most difficult or perhaps impossible for the B's Co. but apparently a routine operation for an experienced operator in the field."[56] The court concluded that impossibility which is personal to the promisor and is not inherent in the nature of the work to be performed, does not excuse nonperformance of a contractual obligation.

Did the Contractor Assume the Risk of Impossibility?

If a specification is shown to be impossible or commercially impractical, the contractor may not recover if

it can be shown that he assumed the risk of impossibility. This assumption of risk generally occurs when a contract clause specifically places the risk on the contractor, or it can be shown that the owner has relied upon the contractor. Similar to a method specification dispute, the clause must be specific, and it must be clear that the risk of impossibility has been placed on the contractor. However, a court may be more likely to enforce a clause shifting the risk to the contractor when a performance specification has been used.

Reliance on the Contractor's Knowledge or Experience

A contractor may also assume the risk of impossibility if it can be shown that the owner or designer has relied on the knowledge or expertise of the contractor. Unlike a method specification, where the owner is presumed to possess the expertise since he has chosen to spell out the method, a contractor can more easily be held to assume the risk of performance with a performance specification. Although this situation is uncommon with most routine or common construction operations, it can occur if a project is utilizing a new or state of the art construction technique or product. Under these circumstances, a contractor may possess information or expertise superior to the designer. If the owner relies on the expertise of the contractor, risk

of failure may shift to the contractor. According to one court, the issue of who assumed the risk rests on two questions: (1) Which party had the greatest expertise in the subject matter, and (2) Which party took the initiative in drawing up the specifications and promoting a particular design?[57]

Although there are few construction contract cases where this criteria has been met, some examples exist. The case most often cited is **Bethlehem Corporation v. United States.**[58] In this case, the Army contracted for the construction of an environmental test chamber. Since the designers had very limited experience in the design of this type of structure, they consulted Bethlehem Corporation concerning the performance characteristics which were achievable. Bethlehem was a known expert in the field, and advised the designers on the limits of possible performance. This advice was used by the designer to develop the specification, and the specification was later revised during advertisement based on a review by Bethlehem. Bethlehem then bid on the project and was subsequently awarded the contract. The chamber was constructed, but was unable to meet the performance requirements for control of relative humidity. The court determined that the specification was impossible to perform, but that the contractor had assumed the risk of non-performance. Bethlehem was aware that it was being consulted as a leader

in the field and that the project designers did not have expert knowledge. The court found that the owner relied upon the representations of the contractor in developing the specification.[59]

This case is contrasted by the decision in **City of Littleton v. Employers Fire Insurance** where the court refused to find that the contractor had assumed the risk of impossibility. During the course of construction, the two five-million-gallon water tanks collapsed. The parties later entered into a supplemental agreement for reconstruction, but the contractor subsequently refused to attempt reconstruction when he determined that the revised design was impossible to construct without the tanks' collapsing again. Both the contract and the supplemental agreement were based on engineering provided by the owner, and there was no showing that the contractor possessed any superior expert knowledge. Additionally, there was nothing in the contract which could be construed as shifting the risk of impossibility to the contractor.[60]

Chapter 4

DEFECTIVE SPECIFICATIONS VERSUS DIFFERING SITE CONDITIONS

It is not always clear if the dispute should be treated as a differing site condition (DSC) or a defective specification. Both result in the contractor expending more effort and expense than anticipated. However, each situation has different criteria which must be met, and recovery is pursued under different legal theories. This chapter discusses the most significant differences. The chapter concludes with an example showing the application of the defective specification flow charts, and a listing of 10 cases which were analyzed using the flow charts to validate the rules.

Information or Instructions?

The primary difference between defective specifications and differing site conditions is the type of information at issue. Differing site conditions deal with information about the conditions to be encountered while defective specifications deal with instructions or details of construction. As discussed in one differing site conditions case, "Bidders are thereby given information on which they may rely in making their bids, and are at the same time

promised an equitable adjustment under the changed conditions clause, if subsurface conditions turn out to be different than those indicated..."[61] (underlining added) Conversely, defective specification claims are based on faulty instructions or design details provided to the contractor which turn out to be inadequate.

Difficulty in Completing the Work

If the conditions are different than stated or as indicated in the contract, under a DSC claim, the contractor may be compensated if the work proves to be more difficult. Under defective specifications, the contractor will not be compensated because of the work is more difficult than he anticipated. As seen in **Baton Rouge Contracting Co.** discussed earlier, a contractor cannot be compensated for difficulty. Instead, he has the burden to prove that the work was impossible or commercially impractical.

Reliance

Another significant difference in recovery between the two deals with reliance. With a DSC claim, it is necessary to show that the contractor relied upon the information which the owner has provided.[62] With defective method specifications, it is not necessary to show that the

contractor has relied upon the design since he has no choice. He was required to follow the design provided by the owner.

Legal Theories

Defective specification cases are normally argued under the theory of implied warranty or impossibility while DSC claims are presented under misrepresentation or the rules established when a DSC clause is present. Sometimes, DSC claims are also argued under the theory of implied warranty. The argument is that the owner implicitly warrants that information provided to the contractor is accurate. However, the rules for recovery are generally the same as those for misrepresentation.[63]

Occasionally, a contractor will present a defective specification claim based upon misrepresentation. **Jasper Construction Inc. v. Foothills Junior College District** is one such case. The contractor argued unsuccessfully that the specification was defective since it misrepresented the method that the contractor could use to construct concrete walls.[64] In this case, the court applied the legal principles of misrepresentation.

Contractors sometimes pursue recovery under both defective specification and differing site conditions. In **Stuyvesant Dredging Co. v. United States**, the contractor was

unable to recover for difficulty encountered while dredging where the court ruled that neither defective specifications or differing site conditions contributed to the difficulties. The court determined that the contractor failed to consult Corps of Engineering records which would have alerted him to the true conditions of the channel, and that the contract was a performance specification which did not carry an implied warranty.[65]

However, in **Foster Construction C.A. and Williams Bros. Co. v. United States**, the contractor was able to recover for both changed conditions and defective specifications. The conditions encountered in constructing bridge piers were different than those indicated in the contract, allowing the contractor to recover for differing site conditions. The conditions also made the design inadequate, and the contractor recovered for additional costs for constructing redesigned concrete piers.[66]

Example of Flow Chart Use

To demonstrate the use of the flow charts, the dispute in **J. L. Simmons V. United States** [67] will be analyzed.

Statement of Facts

In October 1949, the Veteran's Administration awarded a contract for approximately 7 million dollars to J. L. Simmons Company for the construction of a hospital and related facilities in Chicago, Illinois.

During construction of the pile foundations for the hospital building, it was discovered that the cast-in-place concrete piles would not support the design loads. To correct the problem, the owner substituted a composite type pile. The revised specification prescribed in detail the methods and procedures for driving and forming the piles. For example, "The casing and a close fitting interior core were to be driven to a depth approximately equivalent to the length of the upper section of the pile. The core was then to be removed and a pipe section inserted. The core was then to be replaced and the pipe section driven to the required penetration and bearing." [68] The contractor proceeded with the installation of the pile foundations. After nearly 1,700 piles had been driven, the contractor detected movement in some of the pile clusters and notified the owner. After a complete evaluation of the piles installed, extensive restoration work was required to correct the movement problems. This corrective action was the primary subject of this dispute.

Analysis

The relevant questions from Figure 2.1 are discussed below.

Method or Performance Specifications? This question was one of the key issues of this dispute. The owner contended that the contractor contracted to produce the ultimate design objective by application of its own skills and by construction methods of its own choice subject only to minimum standards prescribed for quality and workmanship. However, every detail of the pile work was spelled out, and thus, the specification was clearly a method specification.

Is Specification Defective? Testimony of soils experts confirmed that mass movement and drifting of piles and pile groups was inevitable under the sequence of operations required by the specification. The specifications were clearly defective for the soil conditions present, and the finished product obtained from following the method prescribed was not suitable.

Is Error Patent? After a review of all testimony, the court concluded that neither the government nor the contractor could have known that the pile design was defective. Clearly, the error was not patent.

Did Contractor Assume Risk of Defective Specification? The contract contained standard government contract clauses. There was no express wording in the contract to shift the

risk of defective specifications to the contractor.

Precompletion Loss? The pile movement was not caused by the contractor's failure to protect his work, and the piles were in their final position when the movement was taking place. Thus, precompletion loss was not a factor.

Did Contractor Deviate? This rule was not questioned. There was no attempt to show that the contractor had not followed the specification.

Conclusion

Based upon the flow chart rules, the correct conclusion is that the contractor should recover. The court found that the contractor was entitled to the costs to restore the piles, plus the costs of delays to the overall project.

The flow charts can be used to accurately predict the outcome of defective specification disputes.

Validation of Rules

To evaluate the validity of the rules developed by this research, ten appellate cases were selected and tested. In all ten cases, the results obtained using the rules were consistent with the court decision. In a few cases tested, there was not enough information provided in the record to conclusively determine that the case turned on the same key

issue. The ten cases tested were

Blount Bros. Corp V. United States, 872 F.2d 1003 (1989).

Commercial Contractors v. Sumar Const. Inc., 302 So.2d 88 (1974).

Crookham and Vessels v. Larry Moyer Trucking, 699 S.W. 2d 414 (1985).

Fanning and Doorley Const. Co. v. Geigy Chemical Corp., 305 F.Supp. 650 (1969).

Marine Colloids, Inc. v. M. D. Hardy, Inc., 433 A.2d 402 (1981).

Mayor and City, Etc. v. Clark-Dietz, Etc., 550 F.Sup. 610 (1982).

Neal and Company v. United States, 19 Cl.Ct. 463 (1990).

Olson Plumbing and Heating v. United States, 502 F.2d 950 (1979).

S and T v. Harris, 789 P.2d 640 (1989).

Sandkay Construction Co. v. State, 399 P.2d 1002 (1965).

Chapter 5

SUMMARY AND CONCLUSIONS

This thesis provides the rules used by the courts to resolve defective specification disputes and discusses the differences between defective specifications and differing site conditions. This guide provides construction professionals with the information necessary to resolve defective specification disputes correctly in the field and avoid costly litigation.

Summary

Courts have developed two methods for resolving defective specification disputes. If a method specification is involved, the courts normally rely upon the theory of implied warranty. Performance specifications are resolved using the rules of impossibility. Flowcharts were developed for both method and performance specifications, and each is discussed in detail in Chapters 2 and 3, respectively.

Differing site condition and defective specification claims are frequently difficult to distinguish. The primary differences are discussed in Chapter 4.

Method Specifications

A method specification provides detailed instructions or design details which the contractor must follow. When this type of specification is used, there is an implied warranty that the method is possible to perform, and will result in a satisfactory end product.

Method or Performance? The first step in resolving a defective specification dispute is to determine whether the specification is a method or performance specification. The key question is whether the contract allowed the contractor to choose the method or design which caused the problem. If the contract required the contractor to follow a particular method which proves to be the cause of the failure, the rules for method specifications will be used.

Is the Specification Defective? A specification is considered defective if the product cannot be constructed by the required method, or the end result fails or does not meet end requirements.

If the contractor is not able to construct the product by the method specified, he must show that the method is impossible. He will not be allowed to recover because the method proved to be more difficult than anticipated.

If he is able to perform by the method specified, but the end product is deficient in some manner due to defects in the plans, the contractor will not be responsible.

Is Error Patent? An exception to the implied warranty exists when the defective specification is caused by a patent error. The contractor is obligated to call the error to the owner's attention. The error must be obvious and significant to be considered patent.

Did Contractor Assume Risk of Defective Specification? Courts may find that express contract language shifted the risk of defective specifications to the contractor. Warranty and exculpatory clauses are the most common clauses where this occurs. Exculpatory clauses are generally valid, but are not favored by courts, and will only be enforced if they are very clear and specific.

Warranty clauses normally cover only the contractor's material and workmanship. A few warranty clauses were examined which courts determined were of sufficient scope to include defective specifications. However, courts are hesitant to shift the risk to the contractor when a detailed method has been specified in the contract.

A few cases were discussed where other contract clauses have been held to overcome the implied warranty of the specifications. In these cases, the courts found that a clause or combination of clauses clearly shifted the risk of defective specifications to the contractor.

Precompletion Loss The implied warranty does not place an obligation on the owner to design a structure such that it cannot be damaged or destroyed during construction.

Normally, the contractor is responsible for precompletion loss. An exception to this rule exists when the finished product would also have failed. In this case, the loss is caused by compliance with the specification, and not the contractor's failure to protect his work.

Did Contractor Follow Plans and Specifications? The final exception to the implied warranty rule is when the contractor deviates from the specifications. Even if the specification is defective, the contractor does not have the right to deviate without permission. If he does, he guarantees that the finished product will be acceptable.

Did the Owner Approve the Deviation? If the owner approves a deviation, the contractor will not be responsible. In some cases, knowledge of a deviation may be construed as approval. If the owner accepts the finished structure knowing that the contractor has deviated, he is precluded from later seeking damages for those deviations.

Performance Specifications

A performance specification provides only the objective or standard to be achieved, and allows the contractor to choose methods and materials to achieve the desired outcome. When a contract utilizes a performance specification, the rules of impossibility are used.

Was Performance Impossible or Commercially Impractical?

Contract law allows recovery if performance is commercially impractical as well as absolutely impossible. To be commercially impractical, the contract requirement must be so difficult or expensive that it clearly exceeds what the parties contemplated when the contract was made.

In order to recover for impossibility, the contractor must show that no reasonable method was possible. Additionally, he must show that the impossibility was objective, and not due to his personal inability to perform.

Did the Contractor Assume the Risk of Impossibility?

Even though the specification is impossible, the contractor will not recover if he assumed the risk of impossibility. Risk can be shifted by express terms of the contract.

Risk can also be shifted if the owner or designer has relied upon the contractor's knowledge or expertise. This situation can occur when a project is using a new or state of the art technique or product. To determine how to distribute risk, the court will determine which party possessed the greatest expertise in the subject matter, or took the initiative in promoting a particular design.

Defective Specifications versus Differing Site Conditions

Sometimes when a dispute arises, it is difficult to determine if the dispute stems from a differing site condition or a defective specification.

The primary distinction between the two is that DSC disputes apply to information provided about the conditions to be encountered, while defective specification disputes center around instructions or details of construction.

Differences in what the contractor must prove also differ. For differing site conditions, the contractor is able to recover for difficulty, while he will be unable to recover under defective specifications unless he can show that the work is impossible or commercially impractical.

Conversely, the contractor must prove that he relied upon the information provided to recover under a DSC claim. With defective specifications, this proof is not necessary since he was bound to follow the plans and specifications.

Legal Theories. Defective specification disputes are normally argued under implied warranty while DSC disputes are based upon misrepresentation. Occasionally, a contractor will base his claim on another theory. For example, defective specifications claims have been pursued under misrepresentation, and rules similar to those for DSC claims have been followed. Additionally, DSC claims are

occasionally based upon the theory of implied warranty. In these cases, the rules of recovery are generally the same as those for misrepresentation.

Finally, it is possible for both DSC and defective specification problems to be present in a single dispute. The contractor can recover for both if he can satisfy both sets of rules.

Conclusions

Based upon this research, it is concluded that the courts use a uniform set of rules to resolve defective specification disputes. The rules were found to be consistent for all jurisdictions, and they did not differ between public and private owners.

The implied warranty of method specifications provides strong protection for contractors. There are few exceptions to the rule that the owner will be responsible for defects in the plans, and courts are hesitant to shift the risk of defective plans to the contractor. The primary risks to contractors occur when they ignore patent errors or deviate from the contract without permission.

Performance specifications allow the contractor latitude in choosing the methods of construction, but also increase his responsibility for completing the work. To recover, he has more difficult criteria to meet.

Recommendations for Further Research

The following area is recommended for further research:

1. Architect and engineer liability for defective specifications.

NOTES

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3 W. Jaeger, 1961, A Treatise on the Law of Contracts, 3rd Ed., Volume 18, The Lawyers Co-Operative Publishing Company, Rochester, NY, §1966, p. 186.

4 **United States v. George B. Spearin**, 248 U.S. 132, 137, 63 L.Ed.166, 39 S.Ct. 59 (1918).

5 **J. D. Heidin Construction Company v. United States**, 347 F.2d 235, 241, 171 Ct.Cl. 70 (1965).

6 **United States v. George B. Spearin**, 248 U.S. 132, 136, 63 L.Ed.166 (1918).

7 **Stuyvesant Dredging Co. v. United States**, 11 Cl.Ct. 853, 860, 834 F.2d 1576 (Fed. Cir. 1987).

8 **Utility Contractors, Inc. v. United States**, 8 Cl.Ct 42, 50 (1985).

9 Ibid., page 51.

10 **Laburnum Construction Corporation v. United States**, 325 F.2d 451,457, 163 Cl.Ct. 339 (1963).

11 **J. D. Heidin Construction Company v. United States**, 347 F.2d 235, 241, 171 Ct.Cl. 70 (1965).

12 **Sandy Hites Co. v. State Highway Commission**, 149 SW.2d 828, 834 (1941).

13 **Haehn Management Co. v. United States**, 15 Cl.Ct. 50, 56 (1988).

14 **M^{C}Cree and Company v. State**, 91 NW.2d 713, 725, 253 Minn. 295 (1958).

15 **W. H. Lyman Construction Co. v. The Village of Gurnee**, 403 NE.2d 1325, 1329/1330, 84 Ill.App.3d 28, 38 Ill.Dec. 721 (1980).

16 **Haehn Management Co. v. United States**, 15 Cl.Ct. 50, 56 (1988).

17 **Puget Sound Nat. Bank of Tacoma v. C.B. Lauch Construction Co.**, 245 P.2d 800,803, 73 Ida. 68 (1952)

18 **Mayville-Portland School District No. 10 v. C. L. Linfoot Company**, 261 NW.2d 907,911 (1978).

19 Ibid., page 911.

20 **Beacon Construction Company of Massachusetts v. United States**, 314 F.2d 501, 504, 161 Ct.Cl. 1 (1963).

21 **R. M. Hollingshead Corporation v. United States**, 111 F.Supp 285, 286, 124 Ct.Cl. 681 (1953).

22 **Allied Contractors Inc. v. United States**, 381 F.2d 995, 999, 180 Ct.Cl. 1057 (1967).

23 **Ridley Investment Company v. Croll**, 192 A.2d 925, 926/927, 56 Del. 208 (1964).

24 **W. H. Lyman Construction Co. v. The Village of Gurnee**, 403 NE.2d 1325, 1332/1333, 84 Ill.App.3d 28, 38 Ill.Dec. 721 (1980).

25 **United States v. George B. Spearin**, 248 U.S. 132, 137, 63 L.Ed.166, 39 S.Ct. 59 (1918).

26 **Philadelphia Housing Authority v. Turner Const. Co.**, 23 A.2d 426, 427, 343 Pa. 512 (1942).

27 **W. H. Lyman Construction Co. v. The Village of Gurnee**, 403 NE.2d 1325, 133284 Ill.App.3d 28, 38 Ill.Dec. 721 (1980).

28 **Teufel v. Wiernir**, 411 P.2d 151, 154/155, 68 Wsh. 31 (1966).

29 **Shopping Center Management Company v. Rupp**, 343 P.2d 877, 879/880, 54 Wsh. 624 (1959).

30 **Shuster v. Sion**, 136 A.2d 611, 612, 86 RI. 432 (1957).

31 **Kurland v. United Pacific Insurance Company**, 59 Cal.Rptr. 258, 261, 251 Cal.App.2d 112 (1967).

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57 **Foster Wheeler Corporation v. United States**, 513 F.2d 588, 598, 206 Ct.Cl. 533 (1975).

58 **Bethlehem Corporation v. United States,** 462 F.2d 1400, 19 Ct.Cl. 247 (1972).

59 Ibid., page 1404.

60 **City of Littleton v. Employers Fire Insurance Co.**, 453 P.2d 810, 814, 169 Col. 104 (1969).

61 **Foster Construction C. A. and Williams Bros. Co. v. United States**, 435 F.2d 873. 887, 193 Ct.Cl. 587 (1970).

62 R. M. Pondelick, 1990, "A Guide to Soil Reports and Differing Site Conditions for Construction Professionals," Thesis presented to The Pennsylvania State University, University Park, in partial fulfillment of the requirements for the degree of Master of Science, page 22.

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65 **Stuyvesant Dredging Clo. v. United States**, 11 Cl.Ct. 853, 834 F.2d 1576 (Fed. Cir. 1987).

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Appendix A

AIA Warranty Clause

3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

-AIA Document 201, General Conditions of the Contract for Construction, 1987, The American Institute of Architects, 1735 New York Avenue, N.W., Washington D.C. 20006